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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,951	07/12/2005	Hidenori Akita	CML00596JC	8852
22917	7590	03/25/2008	EXAMINER	
MOTOROLA, INC. 1303 EAST ALGONQUIN ROAD IL01/3RD SCHAUMBURG, IL 60196			CHAN, SAI MING	
			ART UNIT	PAPER NUMBER
			2616	
			NOTIFICATION DATE	DELIVERY MODE
			03/25/2008	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Docketing.Schaumburg@motorola.com  
APT099@motorola.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/541,951	<b>Applicant(s)</b> AKITA, HIDENORI	
	<b>Examiner</b> Sai-Ming Chan	<b>Art Unit</b> 2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 July 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/12/2005</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Priority*

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Information Disclosure Statement*

The information disclosure statements (IDS) submitted on July 12, 2005 has been considered by the Examiner and made of record in the application file.

### *Drawing*

**Figs. 5 and 9** should be labeled as “Prior Art”

### *Claim Objections*

**Claim 1** – missing transition word, e.g. “comprises”.

**Claims 3 and 4** - identical except for the dependence. Claim 4 can be deleted.

**Claim 5** – dependent on claim 1, 2, 3 or 4. Modify the dependence to depend on independent claim will be enough.

**Claim 9** - dependent on claim 7 or 8. Modify the dependence to depend on the independent claim will be enough.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claims 1, 5-7 and 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yasotharan et al. (U.S. Patent Publication # 20040120409)**, in view of **Branlund et al. (U.S. Patent Publication #20030086366)**, and in view of **Kokkonen et al. (U.S. Patent #6606296)**.

Consider **claim 1**, Yasotharan et al. clearly disclose and show a transmitter (fig.1,paragraph 0014 (transmitter)) in an OFDM communication device (abstract (transmitter and receiver)) for synchronizing a transmitter (fig.1,paragraph 0014 (transmitter)) and a receiver (fig. 5, paragraph 0018 (receiver)) with a synchronization preamble (abstract (training signal)), wherein a preamble signal within a time-domain (fig. 3 (training signal in time domain), paragraph 0013), is time-multiplexed with transmit data (fig. 1 (30), paragraph 0029 (multiplex for combining OFDM signals and training signal)) to generate an OFDM transmit signal (fig. 2, paragraph 0015 (OFDM transmitter)).

However Yasotharan et al., do not specifically show a preamble through a low-pass filter. In addition, Branlund et al. clearly show a preamble through a low-pass filter (paragraph 0014 (DMT for synchronization), paragraph 0122 (DMT with FFT and zero padded or the use of a filter bank)).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to demonstrate an OFDM communication device, as taught by Yasotharan, and show a preamble through a low-pass filter, as taught by Branlund, in order to make the correlation more efficient.

However, Yasotharan et al., as modified by Kokkonen, do not specifically disclose a zero amplitude reduced preamble signal.

In the same field of endeavor, Kokkonen clearly shows a zero amplitude reduced preamble signal (column 6, lines 29-32 (amplitude for carrier in the reference signal is set to zero)).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to demonstrate an OFDM communication device, as taught by Yasotharan, show a preamble through a low-pass filter, as taught by Branlund, and incorporate zero amplitude reduced preamble signal, as taught by Kokkonen, so that symbol synchronization between transmitter and receiver can be done smoothly.

Consider **claim 5**, and **as applied to claim 1 above**, Yasotharan et al., as modified by Branlund and Kokkonen, clearly disclose and show a receiver (fig. 5, paragraph 0018 (receiver)) in the OFDM communication device for use with the transmitter, said receiver comprising a synchronization timing detector (fig. 6 (404), paragraph 0056 (pulse train detector)) for determining the cross correlation between a receive signal and a specified synchronization preamble (fig.7(412), paragraph 0056

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(cross-correlator)), which is patterned the same as the counterpart in the transmitter section (paragraph 9 (training signal for symbol synchronization), paragraph 0010 (receiver detects the training signal, paragraph 0056 (cross correlation))), and detecting a synchronization position (paragraph 0096 (number of samples to skip)) in accordance with the determined cross correlation (paragraph 0056 (cross correlation)).

With respect to **claim 7**, it is rejected for the same reason as set forth in **claims 1 and 5**.

Consider **claim 6**, and **as applied to claim 5 above**,

**claim 10**, and **as applied to claim 7 above**,

Yasotharan et al., as modified by Branlund and Kokkonen, clearly disclose and show as described the receiver in the OFDM communication device, wherein the synchronization position is shifted from a peak position (paragraph 0056 (maximum)) of said cross correlation (paragraph 0056 (cross-correlation)) by a specified amount of time (paragraph 0071 (cyclically shifted (time of detection + time of beginning of transmission))).

**Claims 2 and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable

over **Yasotharan et al. (U.S. Patent Publication # 20040120409)**, in view of **Branlund et al. (U.S. Patent Publication #20030086366)**, and **Kokkonen et al. (U.S. Patent #6606296)**, and further in view of **Wu et al. (U.S. Patent Publication # 6850481)**.

Consider **claim 2**, and **as applied to claim 1 above**,  
**claim 8**, and **as applied to claim 7 above**,

Yasotharan et al., as modified by Branlund and Kokkonen, clearly disclose and show a transmitter in the OFDM communication device as described.

However, Yasotharan et al. do not specifically disclose the FFT section in the filter.

In the same field of endeavor, Branlund et al. clearly show an FFT section for subjecting an input signal to fast Fourier transform (paragraph 0122 (DMT with FFT and zero padded is similar to passing through a filter)).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to demonstrate an OFDM communication device, as taught by Yasotharan, and show a preamble through a low-pass filter, as taught by Branlund, in order to make the correlation more efficient.

However, Yasotharan et al. do not specifically disclose zero substitution for output having frequency higher than specified.



In the same field of endeavor, Wu et al. clearly show a zero substitution section for providing zero substitution (column 3, lines 3-8 (a zero value is substituted) for FFT section output components having a frequency higher than specified (column 3, lines 3-8 (noise or frequency higher than specified)).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to demonstrate an OFDM communication device, as taught by Yasotharan, and incorporate FFT, as taught by Branlund, and display zero substitution, as taught by Wu, so that symbol synchronization between transmitter and receiver can be done smoothly.

**Claims 3-4 and 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yasotharan et al. (U.S. Patent Publication # 20040120409)**, in view of **Branlund et al. (U.S. Patent Publication #20030086366)**, **Kokkonen et al. (U.S. Patent #6606296)**, and **Wu et al. (U.S. Patent Publication # 6850481)**, and further in view of **Klank et al. (U.S. Patent # 6226337)**.

Consider **claim 3**, and **as applied to claim 2 above**,  
**claim 4**, and **as applied to claim 1 above**,  
**claim 9**, and **as applied to claim 7 above**,  
Yasotharan et al., as modified by Branlund and Kokkonen, clearly disclose and show a transmitter in the OFDM communication device as described.

However, Yasotharan et al. do not specifically disclose a table that stores values obtained when input signals pass through said ideal low-pass filter in accordance with the values of the input signals.

In the same field of endeavor, Klank et al. clearly show a table (column 3, lines 22-29 (stored in the receiver)) that stores values obtained (column 3, lines 22-29 (sequence transformed by FFT)) when input signals pass through said ideal low-pass filter (column 3, lines 22-29 (sequence transformed by FFT)) in accordance with the values of the input signals (column 3, lines 22-29 (sequence)).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to demonstrate an OFDM communication device, as taught by Yasotharan, and disclose a table that stores values obtained when input signals pass through said ideal low-pass filter in accordance with the values of the input signals, as taught by Klank, so that symbol synchronization between transmitter and receiver can be done smoothly.

### ***Conclusion***

Any response to this Office Action should be **faxed to (571) 273-8300 or mailed to:**

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Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Sai-Ming Chan whose telephone number is (571) 270-1769. The Examiner can normally be reached on Monday-Thursday from 6:30am to 5:00pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Seema Rao can be reached on (571) 272-3174. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 571-272-4100.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

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***Sai-Ming Chan***  
S.C./ sc

/Sai-Ming Chan/  
Examiner, Art Unit 2616

February 8, 2008

/Seema S. Rao/

Supervisory Patent Examiner, Art Unit 2616